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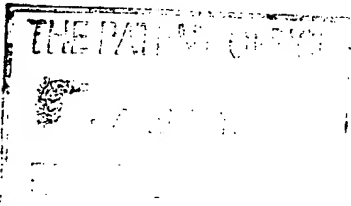
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**Form 1/77**

**Patents Act 1977**

**1 Title of invention**

1 Please give the title of the invention **SURFACTANT COMPOSITIONS**

**2 Applicant's details**

☐ First or only applicant

2a If you are applying as a corporate body please give:

Corporate name **IMPERIAL CHEMICAL INDUSTRIES PLC**

Country (and State of incorporation, if appropriate) **United Kingdom**

2b If you are applying as an individual or one of a partnership please give in full:

Surname

Forenames

2c In all cases, please give the following details:

Address **Imperial Chemical House, Millbank, London**

UK postcode (if applicable) **SW1P 3JF**

Country **United Kingdom**

ADP number (if known) **935003** ✓ *a*

2d, 2e and 2f: If there are further applicants please provide details on a separate sheet of paper.

Second applicant (if any)

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3a Have you appointed an agent to deal with your application?

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Agent's name ROBERTS, Jonathan Winstanley

Agent's address ICI Chemicals & Polymers Limited  
Intellectual Property Department  
PO Box 11, The Heath  
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Agent's ADP  
number 6634869001 ✓

3b: If you have appointed an agent, all  
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4 Agent's or applicant's reference number (if applicable)

CPW 50075/AA

**② Claiming an earlier application date**

5 Are you claiming that this application be treated as having been filed on the date of filing of an earlier application?

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8a Please fill in the number of sheets for each of the following types of document contained in this application.

Continuation sheets for this Patents Form 1/77

Claim(s)

Description

Abstract

Drawing(s)

8b Which of the following documents also accompanies the application?

Priority documents (please state how many)

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Patents Form 7/77 - Statement of Inventorship and Right to Grant  
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Patents Form 9/77 - Preliminary Examination/Search

Patents Form 10/77 - Request for Substantive Examination

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### Surfactant Compositions

This invention relates to surfactant compositions and in particular to surfactant compositions that contain foaming surfactants and emollient materials and to 5 methods of making such compositions.

Surfactant compositions containing emollient materials are known, particularly in the form of personal care products notably shower gels, creaming foam bath products, shampoos, facial wash and body scrub products. Commercially these 10 products, particularly the shower gel products, are often sold as so-called "2 in 1" products. Typically these materials are aqueous emulsions of emollient materials, usually an emollient oil, including one or more surfactant materials dispersed usually in the aqueous phase, but sometimes also in the oil phase. The intent is that the surfactant material(s) act as cleaning agents, and are usually chosen to 15 produce a foaming creamy lather on dispersion into water in the skin or hair, particularly in use as shower gels, foaming cream bath products or shampoos, and the emollient acts to prevent evaporation of skin moisture by restoring the protective layer lost by removal of skin lipids by the detergent in the cleansing product, thus making the later use of a moisturising cream or milk unnecessary. 20 Emollients, particularly emollient oils tend to be incompatible with the foaming surfactants, such as fatty alkyl ether sulphates and betaine surfactants that are commonly used in these products, indeed some emollient oils can act as antifoams. Products that show foaming surfactancy, stability in storage and emollient properties usually have to be carefully formulated and the choice and 25 proportions of the constituents is usually critical. The order of process steps is also often critical to success, particularly as the use of high energy mixing in the presence of highly foaming surfactants is likely to give uncontrolled foaming during processing. The specific formulations and processes that are required to achieve a stable product make for difficulty for manufacturers in developing products as 30 the process needs to be developed separately for each product and makes manufacturing and inventory logistics complicated as there may be little in common in formulation between products that are otherwise ostensibly similar.

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The present invention is based on our discovery that the manufacture of such products can be greatly simplified by the use of a pre-formed surfactant dispersion containing surfactant materials, especially mild surfactant materials, fatty amphiphile and optionally but very desirably hydrocolloid either as a dispersion in 5 water, or and very desirably as a solid mix which can then be dispersed in water.

When the pre-formed surfactant dispersion is a solid mix, an emolinet can be included in the composition either by addition to the aqueous phase before addition of the (solid) surfactant dispersion or added to the water (or the water added to it) at the same time or after addition of the surfactant dispersion. This 10 provides great flexibility in manufacturing processes. We believe that some of the products that can be made by our new simplified process are in themselves new, although products can be made that have compositions that are the same as or similar to known 2 in 1 products that are commercially available.

15 The present invention accordingly provides, in a first product aspect, a stable aqueous foaming surfactant dispersion which comprises:

from 5 to 50 weight % of a surfactant composition comprising at least one foaming surfactant, at least one fatty amphiphile and optionally, but very desirably, at least one hydrocolloid; and

20 from 50 to 95 weight % of water.

The invention also includes, in a second product aspect, a stable aqueous foaming dispersion of a surfactant comprising at least one foaming surfactant, particularly including at least one anionic surfactant, at least one fatty amphiphile 25 and optionally, but very desirably, at least one hydrocolloid, the dispersion also including emulsified therein at least one emollient.

As well as the products the invention includes methods of making surfactant compositions containing emollients and accordingly the present invention provides 30 in a first process aspect a method of making a stable aqueous foaming surfactant dispersion, which comprises dispersing in water, a preformed substantially uniform solid surfactant composition comprising at least one foaming surfactant, at least one fatty amphiphile and optionally, but very desirably, at least one hydrocolloid; In

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weight proportions to give a composition containing from 5 to 50 weight % of the surfactant composition and from 50 to 95 weight % of water.

The invention further includes in a second process aspect, a method of making a stable aqueous foaming surfactant dispersion, which comprises forming an aqueous dispersion of a surfactant composition comprising at least one foaming surfactant, at least one fatty amphiphile and optionally, but very desirably, at least one hydrocolloid; and subsequently dispersing therein at least one emollient.

- 10 The invention specifically includes three variations on the basic process using a pre-formed solid surfactant blend of surfactant, fatty amphiphile and hydrocolloid:
  - (i) A method of making a stable aqueous foaming surfactant dispersion, which comprises mixing from 5 to 50 parts by weight of a pre-formed solid surfactant blend, containing surfactant, fatty amphiphile and hydrocolloid, with the emollient, and optionally other components, adding from 50 to 95 parts by weight of water at a temperature of from 60 to 90°C, particularly 70 to 90°C, homogenising the mixture to disperse the surfactant blend and emulsify the emollient.
  - (ii) A method of making a stable aqueous foaming surfactant dispersion, which comprises dispersing from 5 to 50 parts by weight of a pre-formed solid surfactant blend, containing surfactant, fatty amphiphile and hydrocolloid, in from 50 to 95 parts by weight of water at a temperature of from 60 to 90°C, particularly 70 to 90°C, homogenising the mixture to disperse the surfactant blend and subsequently adding an emollient to the dispersion.
  - 25 (iii) A method of making a stable aqueous foaming surfactant dispersion, which comprises adding from 50 to 95 parts by weight of water at a temperature of from 60 to 90°C, particularly 70 to 90°C to from 5 to 50 parts by weight of a pre-formed solid surfactant blend, containing surfactant, fatty amphiphile and hydrocolloid, homogenising the mixture to disperse the surfactant blend and subsequently adding an emollient to the dispersion.

As is indicated above, the products of and made by the method of the invention are particularly intended for use as personal care products, especially as



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shampoos and shower gels and the invention specifically includes products of the invention in the form of a shampoo or a shower gel and the use of products of or made by the method of the invention as shampoos or shower gels.

5 The foaming surfactant can be or include an anionic, non-ionic, or amphoteric surfactant materials. Suitable anionic types of surfactant include alkyl sulphates, such as lauryl, oleyl and stearyl sulphates, alkyl sulphonates, alkyl ether sulphates, alkyl glycerol ether sulphonates, alkyl phosphate esters, ethoxylated alkyl phosphate esters, sarcosinates, taurate derivatives, hydroxyalkyl sulphonate  
10 esters, such as isethionate esters, particularly of fatty carboxylic acids, for example cocyl isethionic acid, lauryl isethionic acid and stearyl isethionic acid (usually used as the sodium salt), alkyl sulphosuccinates, such as sodium and/or potassium lauryl, oleyl and steryl sulphosuccinates, alkyl sulphosuccinamates, and acyl glutamates. Such anionic surfactants are usually used as metal, usually alkali  
15 metal especially sodium or potassium, ammonium or ethanolamine salts. The alkyl chains in such surfactants are typically  $C_{12 \text{ to } 20}$ , more usually  $C_{14 \text{ to } 18}$  chains. Suitable non-ionic types of surfactant include alkyl polysaccharides especially alkyl polyglucosides, sorbitan ester alkoxyates, and glucamide surfactants. Suitable amphoteric surfactants include betaine derivatives, imidazoline derivatives, and  
20 fatty amphoacetates, particularly coco-amphoacetates. The surfactants may also include soaps, particularly fatty acid alkali metal soaps such as sodium and/or potassium stearate.

As used in personal care products, it may be desirable to include mild surfactants.  
25 Foaming anionic surfactants are usually used as alkali metal salts of acidic groups and if the acid group is a relatively weak acid the salt will give an alkaline mixture in water that can be aggressive to the human skin. To reduce the aggression of the surfactant, it is desirable to use anionic surfactants where the hydrophile is the anionic residue of a relatively strong acid group, usually a sulphate or more usually  
30 a sulphonate group. Typical examples of such surfactants include esters of carboxylic acids including fatty, particularly  $C_{8 \text{ to } 20}$  alkyl, substituents with hydroxyalkylsulphonic acids such as isethionic acid (2-hydroxyethane sulphonic acid;  $\text{HO} \cdot \text{CH}_2 \cdot \text{CH}_2 \cdot \text{SO}_3\text{H}$ ), as salts, usually alkali metal salts, particularly sodium

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salts of  $C_{12}$  to  $C_{20}$  carboxylic isethionates, especially sodium cocylisethionate. Combinations of isethionate surfactants and sulphosuccinate surfactants, for example approximately equal proportions of sodium cocyl isethionate and sodium sulphosuccinate, give particularly good results. Such mild surfactants can be used 5 alone or in combination with other (more harsh) surfactants, but such mixtures will have intermediate mildness properties.

The use of such mild surfactants is an important feature of the invention such that it forms a specific part of the invention so that the first product aspect of the 10 invention accordingly includes: a stable aqueous foaming surfactant dispersion which comprises:

from 5 to 50 weight % of a surfactant composition comprising at least one fatty isethionate foaming surfactant, optionally but desirable at least one sulphosuccinate salt, at least one fatty amphiphile and optionally, but very 15 desirably, at least one hydrocolloid; and

from 50 to 95 weight % of water;

and the second product aspect of the invention accordingly includes a stable aqueous foaming dispersion of a surfactant comprising at least one fatty isethionate foaming surfactant, optionally but desirable at least one 20 sulphosuccinate salt, at least one fatty amphiphile and optionally, but very desirably, at least one hydrocolloid, the dispersion also including emulsified therein at least one emollient oil.

In these mild surfactant based products, the surfactant is desirably mainly or 25 predominantly a mild surfactant, in particular, at least 50%, desirably at least 75% and especially at least 90%, by weight of the surfactant is a mild surfactant, particularly an alkyl sulphonate and/or a fatty isethionate. This again forms a specific aspect of both the first and second product aspects of the invention.

30 The term "fatty amphiphile" refers to compounds which are normally insoluble in water and include a fatty chain, usually an alkyl chain, and a polar hydrophilic group. The polar hydrophilic group is not such as to give the compound water solubility, although it will generally assist in making the compound dispersible in

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- water, and the compound is not sufficiently hydrophilic as to act as an effective surfactant in the system; in other words any contribution to surfactancy is small in comparison to the effect of the foaming surfactant. Suitable materials include fatty alcohols, particularly  $C_8$  to  $24$ , especially  $C_{14}$  to  $20$  fatty alcohols such as stearyl alcohol; fatty acids, particularly  $C_8$  to  $24$ , especially  $C_{14}$  to  $20$  fatty acids such as stearic acid; glyceride fatty esters, particularly mono-, di- and tri- glycerides of  $C_8$  to  $24$ , especially  $C_{14}$  to  $20$  fatty acids such as glyceryl mono- and di- stearate, laurate, palmitate and similar materials; and esters of fatty acids, particularly  $C_8$  to  $24$ , especially  $C_{14}$  to  $20$  fatty acids such as lauric and stearic acid, with polyhydric alcohols such as sorbitan, such as sorbitan laurate. Although the role of the fatty amphiphile is not fully understood, it appears to contribute to structure in the aqueous phase of the system (even though itself it may not be in solution in the water) and thus to enhance the dispersion of the components of the system.
- 15 The hydrocolloid is a hydrophilic material that can be colloidally dispersed in the aqueous system. Typically such materials can be organic or inorganic materials. Organic hydrocolloids are usually polymers of monomers including hydrophilic groups and suitable examples include starch e.g. corn starch, modified starches e.g. partly etherified starches, or dextrans, modified celluloses such as
- 20 carboxyalkyl, especially carboxymethyl, celluloses, xanthan gums, hydrophilic carbomer polymers polyacrylamides, polyvinyl alcohol, polyvinylpyrrolidone, polyacrylates and very high molecular weight polyethylene glycol. Inorganic hydrocolloids are usually oxides with hydrophilic surfaces and suitable examples include water dispersible bentonite clays and aluminium silicates. The
- 25 hydrocolloid seems to act as an aqueous phase viscosifier, rheology modifier and hydrophilic structurant. We have found that the hydrocolloid can give a marked improvement in the stability of the dispersed products, especially on extended storage or storage at relatively high temperatures (as accelerated storage tests - but akin to normal user storage in bathrooms). In compositions containing
- 30 hydrocolloids, we have had no difficulty in achieving compositions stable to cycle testing for 3 months in the cycle:  $50^{\circ}\text{C}$  /  $40^{\circ}\text{C}$  / ambient temperature /  $-5^{\circ}\text{C}$  and for 1 month in the cycle  $-5^{\circ}\text{C}$  /  $40^{\circ}\text{C}$  (12 hours / 12 hours). In referring to stable

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compositions herein, we refer to compositions that meet these stability testing standards.

The emollient is included in the formulation to improve the skin feel and 5 moisturising or conditioning properties of the overall formulation. The emollient can and usually will be an oily material which is liquid at ambient temperature. Alternatively it can be solid at ambient temperature, in which case in bulk it will usually be a waxy solid, provided it is liquid at an elevated temperature at which it can be included in and emulsified in the composition. As is described below 10 manufacture of the composition usually uses temperatures up to 100°C so such solid emollients will have melting temperatures of less than 100°C and usually less than 70°C. Suitable normally liquid emollient oils include non-polar oils, for example mineral or paraffin, especially isoparaffin, oils, such as that sold by ICI Surfactants as Arlamol HD, or polar oils, for example vegetable glyceride oils, 15 animal glyceride oils, such as that sold by ICI Surfactants as Arlamol M812 (caprylic/capric triglyceride), synthetic oils, for example synthetic ester oils, such as those sold by ICI Surfactants as Arlamol IPM and Arlamol DOA, or silicone oils, such as dimethicone oil, or silicones having polyoxyalkylene side chains to improve their hydrophilicity. Suitable emollient materials that can be solid at 20 ambient temperature but liquid at temperatures typically used to make the compositions of this invention include jojoba wax, tallow and coconut wax/oil. Mixtures of emollients can and often will be used and in some cases solid emollients may dissolve wholly or partly in liquid emollients. Where the emollient is a solid at ambient temperature, the resulting dispersion may technically not be 25 an emulsion (although in most cases the precise phase of the oily disperse phase cannot readily be determined) but such dispersions behave as if they were true emulsions and the term emulsion is used herein to include such compositions.

From the discussion above, it can be seen that some materials can fall within the 30 definition of both emollient oil and the fatty amphiphile. We believe that it is for this reason that compositions containing fatty amphiphile can give creamy dispersions in water, that foam readily and have good skin feel and seem to be emollient, even when no emollient oil is specifically added to the composition.

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Fatty alcohols, such as stearyl alcohol, and acids and mono- and di-glycerides are fatty amphiphiles that can also act as emollients.

In the formulations of and made by the methods of the invention, the intent is to form creamy emulsions having good skin feel. We have found that such emulsions typically have swollen surfactant bilayers which wholly or partly enclose the particles or droplets of the disperse phase. This sort of morphology seems to be found in emulsions that give a creamy skin feel and are stable. The presence of such bilayers has been shown to improve moisturising and skin conditioning properties.

The formulations for the invention can have viscosities appropriate for personal care compositions ranging from milks and lotions to creams. Thus the dispersions of the surfactant, fatty amphiphile and hydrocolloid (when present) in water typically have viscosities of the following order for dispersions in water at the stated percentages:

	concn. (% by wt.)	Viscosity (mPa.s)
	25	2000
	30	45000
20	35	80000
	40	500000

The major components of the compositions of and made by the methods of the invention are typically present in the following proportions (parts by weight):

25	material	broad range	usual range	typical values
	surfactant	10 - 60	30 - 55	about 50
	fatty amphiphile	5 - 30	10 - 25	about 15
	hydrophillic colloid	0 - 35	15 - 30	about 25
30	emollient oil	0 - 30	10 - 25	about 20

In formulations of and made by the invention, the proportion of water is in the range 50 to 95% based on the combined weights of water, surfactant, fatty

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amphiphile and hydrocolloid (when present). Within this range, the amount of water is typically from 55 to 95, more usually 60 to 80% by weight with corresponding proportions of combined surfactant, fatty amphiphile and hydrocolloid (when present).

5

Other materials that can be included in the compositions include the materials set out below:

10 Lubricants and/or humectants particularly polyols such as glycerol, sorbitol, propylene glycol, butylene glycol, polyoxyethylene sorbitol, polyoxyethylene glycerol esters, polyethylene glycol (PEG) (particularly liquid PEG's up to PEG 400) and polyoxyethylene methyl glucoside. Such materials act in the final compositions as humectants and antifreeze components and can improve the skin feel of the products. They can also give a process advantage as they can act as lubricants in solid surfactant compositions which can be used as intermediate materials in the process of this invention. This can make manufacture of the solid surfactant composition easier and make the solid formulation more uniform.

20 Disperse phase structurants, such as water dispersible waxes for example vegetable and animal derived waxes, such as beeswax, synthetic waxes and mineral or petroleum waxes.

25 Fillers, pigments, dyes and optical brighteners, such as titanium dioxide; polyquaternary ammonium compounds as conditioning agents; perfumes, fragrances and/or, essential oils; water and/or oil soluble vitamins or derivatives or precursors; antioxidants and/or preservatives; pearlescing agents; peeling and/or scrub agents; plant extracts, particularly water soluble plant extracts; hydroxy-, particularly alpha-hydroxy, and/or polyunsaturated acids; phospholipids; proteins and/or amino acids and/or derivatives; 30 electrolytes; NMF (natural moisturising factor); foam boosters and/or stabilisers e.g. mono- and/or di-ethanolamides and/or amine oxides; and sucrose ester derivatives.

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The products of this invention can be made by a variety of methods. Generally the methods involve dispersion of the surfactant in water which is typically at elevated temperature, usually from 60 to 100°C, particularly 70 to 90°C, more usually from 75 to 95°C. We have found that there can be considerable flexibility in the order of addition of the various components, especially where the surfactant, fatty amphiphile and, where used, hydrocolloid are in the form of a pre-formed solid surfactant blend, which is typically used in the form of flakes. For convenience, oily components of the formulation e.g. the emollient and other oil soluble materials are pre-mixed to form an oily component, similarly the water soluble materials components are pre-mixed to form a water soluble component. Generally perfumes are kept separate from these components as they are added separately to the product at relatively low temperatures, typically below 40°C e.g. about 35°C, to avoid undue loss by volatilisation.

15 In a first such method, the surfactant blend, the oily component and the water soluble component are mixed and then the water is added to them, typically at a temperature of from 60 to 90°C, particularly 70 to 90°C, e.g. about 80°C, and the mixture stirred at the elevated temperature, to make it uniform. For this, moderate stirring e.g. using a paddle stirrer at 250 to 500 rpm (ca 4 to 8.5 Hz) for typically 10 to 15 minutes, seems satisfactory. The mixture is then stirred more vigorously at the elevated temperature to emulsify the oily component. For this stirring using a rotor-stator mixer (on a laboratory scale and Ultra Turrax stirrer has proved satisfactory) at from 6000 to 12000 rpm (100 to 200 Hz) e.g. ca 9000 rpm (150 Hz), for from 30 seconds to 3 minutes, typically about 1 minute, has proved sufficient.

25 Subsequently, the mixture is cooled to ambient temperature, usually under gentle stirring, and the perfume, if any, added when the temperature is about 35°C.

In a second such method, hot water (typically at a temperature of from 60 to 100°C, particularly from 75 to 95 °C e.g. at about 90°C, is added to the surfactant blend, the mixture is stirred as described above to make it uniform and then more vigorously to homogenise it. The oily component and the water soluble component are added after homogenisation, during subsequent cooling under gentle stirring to ambient temperature (adding any perfume at about 35°C), or after

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the mix has cooled to ambient temperature provided that the oily components are liquid at the temperature they are added to the mixture. Desirably, the water soluble components are also liquid at the addition temperature (or are added as an aqueous solution). It seems that even gentle stirring of the oily component into the homogenised surfactant blend in water can give a well dispersed emulsion of the oily component in the aqueous mix.

In a third such method, the surfactant blend is added to hot water, typically at a temperature of from 60 to 90°C, particularly 70 to 90°C, e.g. about 80°C, and the mixture is stirred as described above to make it uniform and then more vigorously to homogenise it. The oily component and the water soluble component are added after homogenisation, during subsequent cooling under gentle stirring to ambient temperature (adding any perfume at about 35°C), or after the mix has cooled to ambient temperature the oily components are liquid when added at the temperature they are added to the mixture. Desirably, the water soluble components are also liquid at the addition temperature (or are added as an aqueous solution). It seems that even gentle stirring of the oily component into the homogenised surfactant blend in water can give a well dispersed emulsion of the oily component in the aqueous mix.

20

Uses for the compositions of and made by the method of the invention include: 2  
In 1 shower formulations, in effect combining a shower gel type surfactant  
formulation and a body milk or cream; foaming cream bath formulations; cream  
shampoos; make-up remover liquid or cream, liquid emulsion for impregnating  
25 make-up remover tissues; creamy hand soap formulations; facial cleanser  
formulations; foaming face cream formulations; scrub/peeling cream, especially for  
use on the face. In such end uses the compositions used according to this  
invention will usually and advantageously be based on mild surfactants as is  
described above and the use of mild surfactants in these end uses and in  
30 formulations for such end uses forms a specific subsidiary aspect of this invention.



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The following Examples illustrate the invention. All parts and percentages are by weight unless otherwise stated.

### Materials

#### 5 Surfactant Blends -

these are pre-formed flaked solid blends containing surfactant, fatty amphiphile and hydrocolloid in the amounts indicated for the particular blends given below. The particular blend used in the Examples is abbreviated SBA.

SBA - a surfactant blend having the following composition by weight

10	Material	parts by weight
	sodium cocyl isethionate	5
	sodium lauryl sulphosuccinate	5
	betaine surfactant	0.3
15	stearyl alcohol	3
	structurant wax	0.5
	corn starch	5
	humectant, pigment etc.	1.5

	Arlamol 812	Emollient oil - Caprylic/Capric Triglyceride ex ICI Surfactants
20	Arlamol HE	PEG-6 Glyceryl Cocoate ex ICI Surfactants
	Germaben II	Preservative ex Sutton Laboratories
	Florabeads	Jojoba Wax Beads ex Florasun (emollient solid at ambient temperature)
	Keltrol	Xanthan Gum ex Kelco
25	Polymer JR125	Polyquaternary ammonium polymer as conditioner, ex Union Carbide
	Silicone Oil	Dimethicone a silicone oil having a stated viscosity of 100 mPa.s.

#### 30 Test Methods

Viscosity measurements were made using a Brookfield LVT viscometer at 25°C, 6 rpm (0.1 Hz) and a suitable spindle (from types A to F); values are quoted in mPa.s.

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**Manufacturing Examples**

The manufacturing methods described below all use four components:

- 1 the surfactant blend (SB as described above)
- 2 the oil soluble additives (OSA) - the emollient and any other oil soluble materials
- 3 the water soluble additives (WSA) - such as additional hydrocolloid e.g. xanthan
- 4 water (distilled water was used in the Examples below)

10 The amounts used vary depending on the product being produced and are indicated below in the Formulation Examples. The methods use a mixing vessel for the main method steps.

**Manufacturing methods**

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**Method I : (400 g to 2 kg batch scale)**

- 1 the water is heated to 80°C;
- 2 the surfactant blend, the oil soluble additives and the water soluble additives are weighed into the mixing vessel;
- 20 3 The water is added to the mixture in the mixing vessel under moderate stirring, about 250 to 500 rpm (ca. 40 to 80 Hz) keeping the temperature at about 80°C. The stirring is continued for 10 to 15 min. until a uniform dispersion is obtained;
- 4 The mixture is homogenised at 80°C by stirring with a rotor/stator type mixer
- 25 (Ultra-Turrax) at about 9000 rpm (150 Hz) for about 1 minute;
- 5 The mixture is cooled to ambient temperature under gentle stirring;
- 6 during cooling the perfume is added to the emulsion when the temperature is about 35°C.

In a minor variation of this method, the homogenisation step is carried out 30 immediately before cooling.

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**Method 2 : (400 g to 2 kg batch scale)**

- 1 Hot water at 90°C is added to the surfactant blend in the mixing vessel
- 2 the mixture is stirred (at about 250 to 500 rpm) keeping the temperature at about 80°C for 10 to 15 min. until a uniform dispersion is obtained;
- 5 3 The mixture is homogenised at 80°C by stirring with a rotor/stator type mixer (Ultra-Turrax) at about 9000 rpm for about 1 minute;
- 5 The mixture is cooled to ambient temperature under gentle stirring;
- 6 before during or after cooling the oil soluble additives and the water soluble additives are added as liquids to the mixture (under gentle stirring);
- 10 7 during cooling the perfume is added to the emulsion when the temperature is about 35°C.

**Method 3 : (400 g to 2 kg batch scale)**

- 1 The surfactant blend (as flakes) is added to hot water at 80°C in the mixing
- 15 vessel under moderate stirring (at about 250 to 500 rpm) keeping the temperature at about 80°C for 10 to 15 min. until a uniform dispersion is obtained;
- 2 The mixture is homogenised at 80°C by stirring with a rotor/stator type mixer (Ultra-Turrax) at about 9000 rpm for about 1 minute;
- 20 3 The mixture is cooled to ambient temperature under gentle stirring;
- 4 before during or after cooling the oil soluble additives and the water soluble additives are added as liquids to the mixture (under gentle stirring);
- 5 during cooling the perfume is added to the emulsion when the temperature is about 35°C.

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**Formulation Examples**

These Examples give the percentages (w/w) of materials used to make the products referred to. Any of the methods described above can be used for any of 5 the Formulation Examples.

**Formulation Example 1 : "2-in-1" shower gel + body milk**

Material		%(w/w)
SB	SBA	30
OSA	Arlamol M812	5
	Arlamol HE	3
WSA	Germaben II	1
Water		to 100

This product has a viscosity of 30000 mPa.s

**Formulation Example 2 : "2-in-1" shower gel + body milk**

Material		%(w/w)
SB	Arlatone Duo	35
OSA	Silicone oil	5
WSA	Germaben II	1
Water		to 100

This product has a viscosity of 60000 mPa.s

**Formulation Example 3 : Foaming cream bath**

Material		%(w/w)
SB	Arlatone Duo	25
OSA	Arlamol HE	5
WSA	Germaben II	1
Water		to 100

This product has a viscosity of 20000 mPa.s

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**Formulation Example 4 : Foaming scrub cream for face and body**

5

Material		%(w/w)
SB	Arlatone Duo	35
OSA	Florabeads	5
WSA	Germaben II	1
Water		to 100

This product has a viscosity of 60000 mPa.s

**Formulation Example 5 : Liquid make-up remover**

10

Material		%(w/w)
SB	Arlatone Duo	20
OSA	Arlamol HD	5
WSA	Keltrol	0.3
	Germaben II	1
Water		to 100

15 This product has a viscosity of 5000 mPa.s

**Formulation Example 6 : Foaming face cream**

20

Material		%(w/w)
SB	Arlatone Duo	35
OSA	Arlamol HD	2
WSA	Germaben II	1
Water		to 100

This product has a viscosity of 40000 mPa.s

**Formulation Example 7 : Conditioning cream shampoo**

25

Material		%(w/w)
SB	Arlatone Duo	30
OSA	Polymer JR125	0.1
WSA	Germaben II	1
Water		to 100

30 This product has a viscosity of 35000 mPa.s

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